Abstract of the Disclosure

A single crystalline aluminum nitride laminated substrate comprising a single crystalline α-Al_2O_3 substrate such as a sapphire substrate, an aluminum oxynitride layer formed on the substrate and a single crystalline aluminum nitride film as the outermost layer, wherein the dislocation density in the single crystalline aluminum nitride is $10^8/cm^2$ or less.

The above single crystalline aluminum nitride laminated substrate is formed by nitriding the substrate by heating in the presence of carbon, nitrogen and carbon monoxide.

The above single crystalline aluminum nitride film has a law dislocation density, little lattice mismatching and excellent crystallinity. A Group III element nitride film having excellent luminous efficiency can be formed on this aluminum nitride film. The above laminated substrate is used in a base substrate for a Group III element nitride film, a light emitting device and a surface acoustic wave device.